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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,023	06/15/2007	Lucy M. MacGregor	DYOUNG0319US	9312
23908 7590 03/07/2011 RENNER OTTO BOISSELLE & SKLAR, LLP 1621 EUCLID AVENUE NINETEENTH FLOOR CLEVELAND, OH 44115				
EXAMINER CHERRY, STEPHEN J				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/598,023

Applicant(s)

MACGREGOR ET AL.

Examiner

STEPHEN J. CHERRY

Art Unit

2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2011.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-51 and 53-56 is/are pending in the application.
4a) Of the above claim(s) 37-50, and 53-54 is/are withdrawn from consideration.
5) ☒ Claim(s) 30-36, 51, 55 and 56 is/are allowed.
6) ☒ Claim(s) 1-3, 11, 18-26, 28 and 29 is/are rejected.
7) ☒ Claim(s) 4-10, 12-17 and 27 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of Filing as Filed (PTO-502)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 11, 18-26, and 28-29 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,825,188 to Montgomery et al.

Regarding claim 1, Montgomery discloses a method of analyzing results from an electromagnetic survey of an area that is thought or known to contain a subterranean resistive or conductive body ('188, col. 6, line 30), comprising: providing electric field data ('188, col. 8, line 41) and magnetic field data ('188, col. 8, line 30) obtained by at least one receiver from at least one horizontal electric dipole (HED) transmitter ('188, fig. 2, ref. 9, with component in horizontal direction); determining a vertical gradient in the electric field data ('188, col. 10, line 24); and combining the vertical gradient in the electric field data with the magnetic field data to generate combined response data ('188, col. 10, line 24), wherein the combining step is executed by a computer ('188, col. 8, line 52).

Regarding claim 2, Montgomery discloses a method of analysing results from an electromagnetic survey according to claim 1, wherein the electric field data include a horizontal component of electric field resolved along a first direction and the magnetic field data include a horizontal component of magnetic field data resolved along a second direction, the first and second directions being different ('188, col. 10, line 24, cross product involves 3 dimensional vector calculation).

Regarding claim 3, Montgomery discloses a method of analysing results from an electromagnetic survey according to claim 2, wherein the first and second directions are orthogonal to one another ('188, col. 10, line 24, cross product involves 3 dimensional vector calculation, with orthogonal vector components).

Regarding claim 11, Montgomery discloses a method of analysing results from an electromagnetic survey according to claim 1, further comprising: providing background data specific to the area being surveyed; and comparing the combined response data with the background data to obtain difference data sensitive to the presence of a subterranean resistive or conductive body ('188, claim 5, "g").

Regarding claim 18, Montgomery discloses a method of analysing results from an electromagnetic survey according to claim 11, wherein the background data are obtained from a controlled source electromagnetic survey ('188, claim 5, "g").

Regarding claim 19, Montgomery discloses a method of analysing results from an electromagnetic survey according to claim 11, wherein the background data are obtained from a magneto-telluric electromagnetic survey ('188, claim 5, "g").

Regarding claim 20, Montgomery discloses a method of analysing results from an electromagnetic survey according to claim 11, wherein the background data are further combined response data obtained from another electromagnetic survey of the area performed at a different time ('188, claim 5, "g", "changes over time").

Regarding claim 21, Montgomery discloses a method of analysing results from an electromagnetic survey according to claim 11, wherein the background data are calculated from a rock formation model ('188, claim 5, "l").

Regarding claim 22, Montgomery discloses a method of analysing results from an electromagnetic survey according to claim 21, wherein the rock formation model is derived from a combination of geological data and resistivity data ('188, claim 5, "l").

Regarding claim 23, Montgomery discloses a method of analysing results from an electromagnetic survey according to claim 22, wherein the geological data are from seismological surveying.

Regarding claim 24, Montgomery discloses a method of analysing results from an electromagnetic survey according to claim 22, wherein the resistivity data are from well logging.

Regarding claim 25, Montgomery discloses a method of analysing results from an electromagnetic survey according to claim 1, wherein difference data are obtained as a function of position within the area ('188, claim 5, "g", with data a function of position of ref. 3, 11, 41 and 42).

Regarding claim 26, Montgomery discloses a method of analysing results from an electromagnetic survey according to claim 1, wherein the resistive or conductive body is a resistive body ('188, col. 6, line 30).

Regarding claim 28, Montgomery discloses a computer program product bearing comprising a machine readable medium bearing machine-executable instructions for implementing a method of analysing results from an electromagnetic survey according to claim 1 ('188, col. 8, line 51).

Regarding claim 29, Montgomery discloses a computer apparatus loaded with machine readable executable instructions for implementing the method of analysing results from an electromagnetic survey according to claim 1 ('188, col. 8, line 51).

Allowable Subject Matter

Claims 4-10, 12-17, and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As indicated in the Office Action dated 10-7-2010.

Claims 30-36, 51 and 55-56 are allowed.

The following is an examiner's statement of reasons for allowance:

As indicated in the Office Action dated 10-7-2010.

Response to Arguments

Applicant's arguments filed 1-7-2011 have been fully considered but they are not persuasive.

Initially, applicants characterization of '188 to Montgomery, at the last paragraph of page 12 of the response, states, "By observing horizontal variations in electric and magnetic fields at the surface of the earth, the direction of the subterranean current flow, and hence ground water, can be determined (e.g., see column 3, lines 60 to 67)". It is noted that the cited paragraph describes, "Using vector analysis, distance corrections, profile plots, modeling, contouring, and other reduction methods described later, the relevant properties of the magnetic and electric fields at each station are thus calculated and plotted. Using all or part of this data depending on the subsurface information needed, it is possible to map the subsurface path and activities of groundwater and subsurface solutions on the surface." Thus, there is no limitation stated regarding "horizontal variations"; rather, the cited section requires "vector analysis", a three dimensional operation, particularly in view of the recitation at '188, col. 9, line 11, which indicates that the electric field is measured with a dipole in any direction.

Applicant argues that Montgomery does not disclose determining a vertical gradient of the electric field data; however, this is required to form the cross product of electric and magnetic field gradients, as described at '299, col. 10, line 29. Cross product is a well known quantity in electromagnetism whereby three dimensional vectors are combined to form another three dimensional vector. Additionally, the

measurement of gradient of a field of a vertical structure, as indicated at '188, col. 10, line 43, would be interpreted as a vertical component because the relative distance between the structure and the surface of the earth would be changing. Applicant argues that the "crossed" electric and magnetic field gradients of Montgomery, has nothing to do with vertical gradients; however, because the vector cross product is a three dimensional quantity, each component, including the vertical component is required for the calculation. Applicant further argues that Montgomery does not disclose combining vertical gradient in the electrical field with the magnetic field data; however, the disclosed vector cross product performs this combination. Applicant further states that only horizontal gradients can cross one another; however, this interpretation ignores the accepted definition of cross product in the art.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHEN J. CHERRY whose telephone number is (571)272-2272. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. J. C./
Examiner, Art Unit 2857

Drew A. Dunn
/Drew A. Dunn/
Supervisory Patent Examiner, Art Unit 2857

